REMARKS

Reconsideration of the instant application is respectfully requested. The present amendment is responsive to the Office Action of March 25, 2004, in which claims 1-20 are presently pending. Of those, claims 1-3 have been rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent 2,731,794 to Torell, in view of U.S. Patent 6,619,261 to Wang, et al. In addition, claims 6-10, 13-17 and 20 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Torell, in view of U.S. Patent 5,533,329 to Ohyama, et al., and in further view of U.S. Patent 5,622,042 to Mirsky, et al. Finally, claims 4-5, 11-12 and 18-19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form. For the following reasons, it is respectfully submitted that the application is now in condition for allowance.

As an initial matter, the preambles of claims 14-19 have been amended to correctly reflect that they are system claims depending from independent claim 13.

With regard to the §103 rejections of claims 1-3, the Applicants respectfully traverse the same for the reasons that: (i) there is no motivation for one skilled in the art to combine the teachings of the Torell and Wang references; and (ii) the combination of the teachings of the Torell and Wang references still does not teach or suggest each of the claimed elements of claims 1-3. Furthermore, with regard to the §103 rejections of claims 6-10, 13-17 and 20, the combination of the teachings of the Torell, Ohyama and Mirsky references does not result in the claimed invention as set forth in claims 6-10, 13-17 and 20.

For an obviousness rejection to be proper, the Examiner must meet the burden of establishing that (1) all elements of the claimed invention are disclosed in the prior art; (2) that the prior art relied upon, coupled with knowledge generally available in the art at the time of the invention, must contain some suggestion or incentive that would have motivated the skilled artisan to modify a reference or to combine references; and (3) that

the proposed modification of the prior art must have had a reasonable expectation of success, determined from the vantage point of the skilled artisan at the time the invention was made. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988); *In Re Wilson*, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970); *Amgen v. Chugai Pharmaceuticals Co.*, 927 U.S.P.Q.2d, 1016, 1023 (Fed. Cir. 1996).

With regard to the second element, there are three possible sources for a motivation to combine references: the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art. *In re Rouffet*, 149 F.3d 1350, 1357, 47 USPQ2d 1453, 1457-58 (Fed. Cir. 1998) (The combination of the references taught every element of the claimed invention, however without a motivation to combine, a rejection based on a *prima facie* case of obvious was held improper.). The level of skill in the art cannot be relied upon to provide the suggestion to combine references. *Al-Site Corp. v. VSI Int'l Inc.*, 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Cir. 1999). Furthermore, the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990).

A statement that modifications of the prior art to meet the claimed invention would have been " 'well within the ordinary skill of the art at the time the claimed invention was made' " because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a *prima facie* case of obviousness without some objective reason to combine the teachings of the references. *Ex parte Levengood*, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993). See also *In re Kotzab*, 217 F.3d 1365, 1371, 55 USPQ2d 1313, 1318 (Fed. Cir. 2000).

Turning first to the §103 rejections of claims 1-3, the Examiner has taken the position that the combination of the teachings of Torell and Wang results in the invention defined in claims 1-3. For convenience, independent claim 1 is reproduced below (with the elements thereof annotated in accordance with the Examiner's analysis):

1. A method for estimating a temperature profile for individual combustion cans at an inlet of a gas turbine, the method comprising:

(a) determining an exhaust temperature profile of exhaust gas of the gas turbine; and

(b) inputting said exhaust temperature profile into a model-based estimator of turbine components through which turbine gas flows;

(c) wherein said model-based estimator calculates an estimated inlet temperature profile at the gas turbine inlet, based upon said exhaust temperature profile and design parameters of the gas turbine, said estimate inlet temperature profile being indicative of the actual firing temperature of each of the individual combustion cans.

As to claim 1, the Examiner indicates in the present Office Action that Torell discloses element (a) (i.e., determining an exhaust temperature profile of exhaust gas of the gas turbine), but does not disclose elements (b) or (c). However, the Examiner goes on to indicate that Wang discloses (b) inputting the exhaust temperature profile into a model-based estimator of turbine components through which turbine gas flows; and (c) wherein the model-based estimator calculates an estimated inlet temperature profile at the gas turbine inlet, based upon the exhaust temperature profile and design parameters of the gas turbine, the estimate inlet temperature profile being indicative of the actual firing temperature of each of the individual combustion cans.

The Applicants have reviewed the Wang reference, including the specific portions thereof cited by the Examiner, and respectfully submit that Wang does not in fact teach or suggest, as required by claims 1-3: inputting ***an exhaust temperature profile*** into a model-based estimator of ***turbine components through which turbine gas flows***; and wherein the model-based estimator calculates ***an estimated inlet temperature profile*** at the gas turbine inlet, ***based upon the exhaust temperature profile and design parameters of the gas turbine***, the estimate inlet temperature profile being indicative of the actual firing temperature of each of the individual combustion cans.

The discussion of input temperature information in Wang relates to the temperature of an intake manifold of an internal combustion engine. To this end, Wang illustrates an intake manifold temperature sensor 48 disposed in fluid communication with the intake manifold of 14 of engine 12. (See col. 3, lines 38-40; Figure 1). One skilled in the art will recognize that the internal combustion engine of Wang is a wholly different apparatus than a gas turbine of the present claims and, more particularly, that the temperature of an intake manifold is not the same as the exhaust temperature of a gas turbine.

Moreover, a review of column 8, lines 33-37 of the Wang reference reveals that the model-based function F2 "produces an estimate of the ***engine exhaust gas*** temperature, T_{EX}, as a function of the various inputs to block 130." (Emphasis added) Again, however, the model-based function disclosed by Wang does not calculate the same parameter as defined in the present claims (i.e., calculates an estimated inlet temperature profile at the gas turbine inlet). As such, it follows that the model-based function of Wang does not base its calculations upon both (1) an exhaust temperature profile of gas turbine exhaust gas and (2) design parameters of the gas turbine, since Wang's estimation relates to combustion engine exhaust gas temperature using parameters relating to an internal combustion engine.

Therefore, since all of the elements of claims 1-3 are not taught or suggested in the combination of Torell and Wang, there can be no finding of obviousness based on these references. Furthermore, because Wang is directed to controlling engine fueling of an internal combustion engine, one skilled in the art would (in the first place) not be motivated to combine the teachings thereof with another reference that discusses turbine inlet temperature of a gas turbine power plant.

Turning next to the §103 rejections of claims 6-10, 13-17 and 20, the Examiner has taken the position that the combination of the teachings of Torell, Ohyama and Mirsky results in the invention defined in claims 6-10, 13-17 and 20. For convenience,

independent claim 6 is reproduced below (with the individual elements thereof annotated):

6. A method for estimating a temperature profile for individual combustion cans at an inlet of a gas turbine, the method comprising:

(a) obtaining exhaust temperature data from exhaust of the gas turbine;

(b) normalizing said exhaust temperature data to a reference load condition to obtain a normalized exhaust temperature profile;

(c) inputting said normalized exhaust temperature profile into a model-based estimator of turbine components through which turbine gas flows;

(d) wherein said model-based estimator calculates an estimated inlet temperature profile at the gas turbine inlet, based upon said normalized exhaust temperature profile and design parameters of the gas turbine, said estimate inlet temperature profile being indicative of the actual firing temperature of each of the individual combustion cans.

As to claim 6 (and claims 13 and 20), the Examiner essentially states on pages 3-4 of the Office Action that claim element (a) is disclosed in Torell, claim element (b) is disclosed in Ohyama, and that claim elements (c) and (d) are disclosed in Mirsky. With respect to claim element (b), the Applicants submit that Ohyama does not in fact teach "normalizing exhaust temperature data to a reference load condition to obtain a normalized exhaust temperature profile." In actuality, a review of Ohyama reveals only that a load demand signal is inputted initially into a control unit. Any mention of temperature data in column 4 of Ohyama is in the context of temperature sensors placed in the combustor itself. Thus, Ohyama does not teach normalizing exhaust temperature profiles, as is presently claimed.

In addition, the Applicants respectfully submit that the Mirsky reference does not in fact teach claim elements (c) and (d) of claims 6-10, 13-17 and 20. In particular, an inspection of the cited portions of the Mirsky reference reveals that while the control

method therein dynamically estimates the temperature downstream of the combustor by using measurements from existing thermocouples, it does not do so by using a model of turbine based components. Rather, the additional information used by Mirsky (besides thermocouple data) is either pressure or speed measurements of the air exiting the compressor upstream of the combustor. (See column 2, lines 37-43) Since air pressure/speed measurements are not the same as actual turbine components/design parameters of the gas turbine, Mirsky does not teach claim elements (c) and (d).

Therefore, for the reasons indicated above, the Applicants respectfully submit that since all of the elements of claims 6-10, 13-17 and 20 are not taught or suggested in the combination of Torell, Ohyama and Mirsky, there can be no finding of obviousness based thereon.

Accordingly, it is respectfully submitted that each of the outstanding §103 rejections have been overcome, and that the present application is now in condition for allowance. No new matter has been entered and no additional fees are believed to be required. However, if any fees are due with respect to this Amendment, please charge them to Deposit Account No. 07-0845 maintained by Applicants' attorneys.

Respectfully submitted,
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